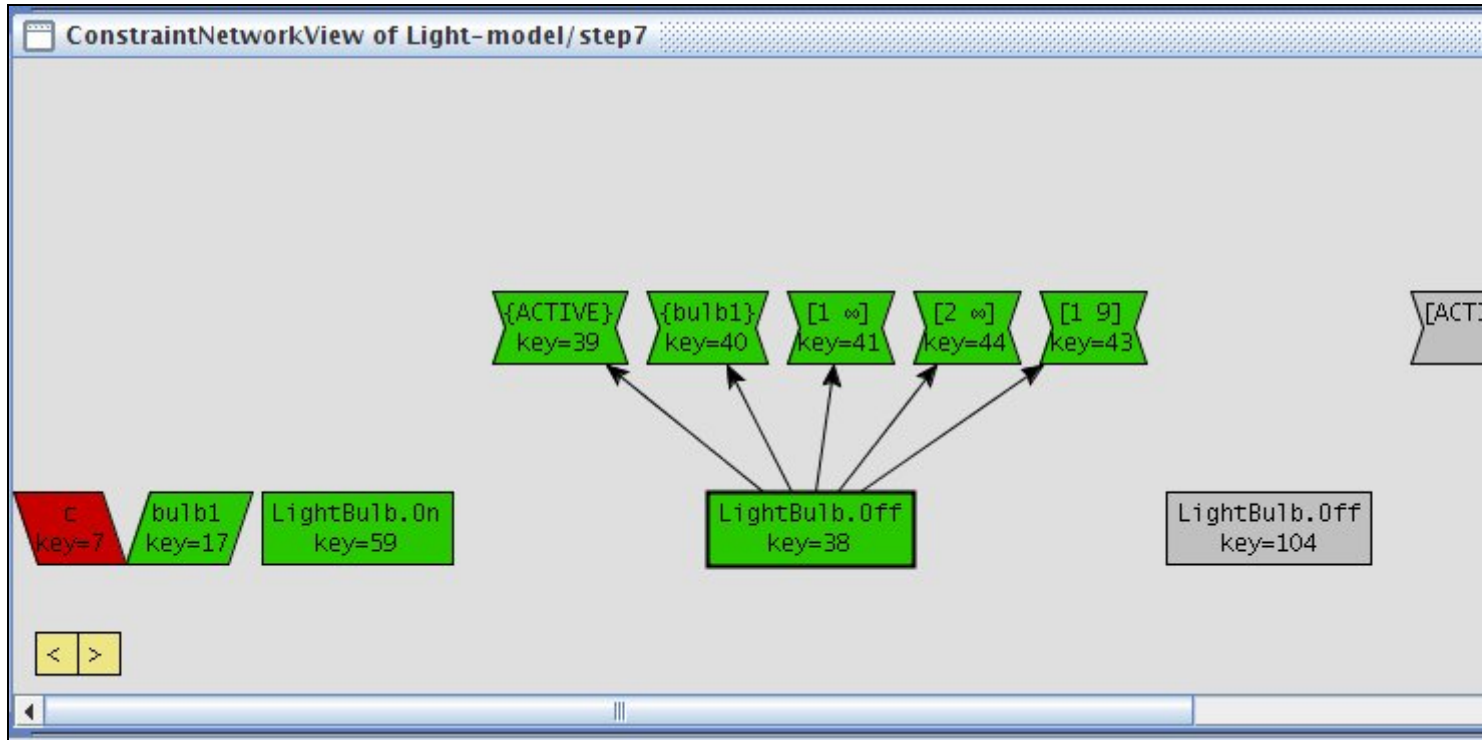# PlanWorks Constraint Network View

An incrementally built directed graph of objects, resources, timelines, interval tokens, resource transactions, rule instances, their variables and their constraints:

Because of its complexity, initially only the variable container nodes (objects, resources, timelines, interval tokens, resource transactions, and rule instances) are displayed. They are "opened" by mouse clicks which lay out the variable container's variable nodes. Clicking on variable nodes "opens" them to show or link to their nearest neighbors (constraints or variable containers). Similarly, clicking on constraint nodes "opens" their nearest neighbors. Clicking on an "open" node (bold border), "closes" that nodes nearest neighbor nodes/links, provided the link counts are 1. Then the node becomes "closed" and has an unbold border. The active node ("opened" or "closed" by Mouse-Left click) is positioned in the center of the view after layout, and highlighted by a bright green rectangle.

The view background Mouse-Right pop-up offers, in addition to the "standard" selections, "Find Entity Path" and "Highlight Current Path". "Find Entity Path" requests two entity keys, class node types to search, and an optional maximum path length. "Find Path" finds a path through the classes specified, rendering the selected nodes and highlighting them. This dialog also offers "Does Path Exist" which determines whether a path exists, without finding the nodes. Selected nodes are dragged as a group, which may be inconvenient. To deal with this, click Mouse-Left in the background to discard the selections, drag the nodes to new locations, and then on the background select Mouse-Right: "Highlight Current Path".

Mouse cursor over all variable container nodes, except for interval tokens and resource transactions, displays the node name, and Mouse-L: open" on the second line. Mouse cursor over interval token nodes displays "predicateName(parameterValues)" on the first line, its slot key value on the second line, and "Mouse-L: open" on the third line. Mouse cursor over resource transaction nodes displays the resource name and its change amount on the first line, and "Mouse-L: open" on the third line. Mouse cursor over variable nodes displays "variableType" on

the first line, and "Mouse-L: open" on the second line. Mouse cursor over constraint nodes displays "constraintType" on the first line, and "Mouse-L: open" on the second line. Clicking Mouse-Left on a node link will make visible two small hollow squares, one at the "root" of the link, and the other at the tip of the arrow.